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PREVALENCE OF BRUCELLA AGGLUTININS AMONG MAN AND CATTLE IN IRAQ

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انتشار اجسام التلازن المضادة لداء البروسيلا في الانسان والماشية

الخلاصة:

تم دراسة انتشار الاجسام المضادة لداء البروسيلا بين الاشخاص والمواشي المنتجة للحليب باستعمال طرق التلازن القياسية. استعمل فحص التلازن على البطاقة لغربلة العينات المصلية للكشف عن وجود اجسام التلازن واستعمل فحص التلازن في الانبوب للتأكد من النتائج الموجبة. عينات الدم جمعت من الفلاحين والعمال والاداريين في احد عشر محطة منتجة للحليب وكذلك من العاملين في مصنع منتجات الحليب المركزي. كذلك تم جمع عينات الدم من المواشي في تسع محطات لانتاج الحليب. تم فحص ٩١٠ عينات من الاشخاص فظهر ان ١٣ عينة (١,٤٪) وخمس عينات (٠,٦٪) كانت موجبة في فحص التلازن على البطاقة وفحص التلازن في الانبوب على التوالي. تسعة عشر عينة (٤,٣٪) وثمان عينات (١,٨٪) من ٤٤١ عينة من المواشي اعطوا نتيجة موجبة لداء البروسيلا بواسطة فحص التلازن على البطاقة وفحص التلازن في الانبوب على التوالي. تم مناقشة الاهمية الصحية لهذا المرض، كذلك مناقشة الحاجة الى دراسات اخرى.

SUMMARY:

The prevalence of Brucella agglutinins among man and dairy cattle was studied using standard agglutination techniques. The card agglutination test was used as a screening test and the tube agglutination test for confirmation of positive results. Blood samples were collected from farmers, workers and administrative personnel at 11 dairy production stations and the central dairy products factory, and from cattle of nine dairy production stations. Out of 910 human serum samples 13 (1.4%) and 5 (0.6%) were positive by card test and tube agglutination test respectively. Sera from 19 (4.3%) and 8 (1.8%) of 441 animal serum samples were positive for brucellosis by card test and tube agglutination test, respectively. The public health importance of the disease and the need for further studies are discussed.

INTRODUCTION:

Brucellosis is primarily a disease of animals which can be transmitted to man[1]. It is a world problem of both public health and economic importance[2]. Human infections are acquired by ingestion of fresh milk or its derivatives, especially cream and in many countries fresh cheese or possibly raw meat from infected animals. Contact with animals or their products is a cause of infection in veterinarians, abattoir workers, farmers and others who work with animals and their products[3]. Person to person spread is rare but it can probably eccur[4,5]. In Iraq few reports on brucellosis among cattle, goats, sheep and camels are favailable[6-12]. The disease in man

was reported as early as 1938[13] and nowadays, possibly due to increased awareness or a real increase in cases, it is commonly being reported in patients with fever or other complaints and in those in close contact with animals[14-19].

The present study was aimed at studying the prevalence of Brucella agglutinins among workers at dairy production stations and the central dairy products factory and among cattle at the dairy production stations.

MATERIALS AND METHODS:

Blood samples were collected from farmers, workers and administrative personnel at 11 dairy production stations in the neighborhood of Baghdad area (775 samples) and from the staff and workers at the central dairy products factory in Abu-Ghraib (135 samples), a total of 910 blood samples, Investigated subjects have a mean age of 32.59 ± 15.24 (range 11-74) years with a male: female ratio of 1.93:1 and no clinical symptoms of brucellosis at the time of examination. Blood samples were, also, collected from 441 cattle at nine of the dairy production stations. Sera were separated from clotted blood by centrifugation and stored at- 20°C until tested for the presence of agglutinins. Serum testing was carried out at the Institute of Veterinary Research, Abu-Ghraib, Iraq. The Brewer's card agglutination test (Hynson, Westcott and Dunning, Inc., Baltimore, Maryland, USA) was used as a screening test for brucella agglutinins and positive samples were retested by the standard tube agglutination test (CWLTH Serum Labs, Melbourne, Australia).

The methods used were those described by Alton et al[20] and as described in the instruction sheets supplied. Human sera having a titer of 1:80 or higher and bovine sera having a titer of 1:160 or higher by the tube agglutination test were taken as positive for brucellosis.

RESULTS:

Of the 910 human serum samples 13 (1.4%) and 5 (0.6%) were positive by card test and tube agglutination test, respectively (Table 1). Human subjects positive by the tube agglutination test have a mean age of 37.40 ± 13.43 (range 18-45) years with a male: female ratio of 4:1. Sera from 19 (4.3%) and 8 (1.8%) out of 441 bovine serum samples had positive brucella agglutinins by card test and tube agglutination test, respectively (Table 2). Significantly, three out of the five human sera positive by the tube agglutination test were from the same dairy stations where six out of the eight bovine sera had brucella agglutinins in diagnostic titer.

DISCUSSION:

The transmission of brucella infection to man and its prevalence in different areas of the world depend upon local food habits, methods of processing milk for cream, butter and cheese, social customs, types of animal husbandry, species of brucella prevalent in the region, climatic conditions, and standards of personal and environmental hygiene[2,3]. Information from the World Health Organization indicates that half a million cases of burcellosis occur each year worldwide and it has been estimated that for each case reported, another 26 are either unrecognized or unreported[21]. The disease has been mainly reported from mediteranian countries, the Middle East, Africa, Central and South America and Central Asia[22-24]. Brucellosis has been eradicated from Scotland, Norway, Sweden, Finland, Denmark, Switzerland, Czechoslovakia and Rumania[25,26].

In many parts of the world cattle are heavily infected with Brucella abortus, but where the animals are kept along with goats or sheep they are readily infected with B. melitensis

Table 1- Brucella agglutinins among human subjects investigated.

Station No.	No. examined	No. positive (%) card test	No. positive (%) Tube agglutination test
01	097	05 (5.2)	2 (2.1)
02	171	05 (2.9)	1 (0.6)
03	032	--	--
04	031	--	--
05	055	01 (1.8)	1 (1.8)
06	050	01 (2.0)	--
07	048	--	--
08	051	--	--
09	090	--	--
10	089	--	--
11	061	--	--
12*	135	01 (0.7)	1 (0.7)
Total	910	13 (1.4)	5 (0.6)

* Central Dairy Products Factory.

Table 2- Brucella agglutinins among cattle.

Station No.	No. examined	No. positive (%) card test	No. positive (%) Tube agglutination test
1	053	11 (20.8)	2 (3.8)
2	058	05 (08.6)	4 (6.9)
3	051	--	--
4	048	--	--
5	031	02 (06.5)	2 (6.5)
6	050	--	--
7	024	--	--
8	058	--	--
9	068	--	--
Total	441	19 (04.3)	8 (1.8)

Here cattle shedding B. melitensis in the milk consitute a serious public health problem[1,3]. The Institute of Veterinary Research in Abu-Ghraib, Iraq in collaboration with the FAO/WHO collaborating centre for Research on Brucellosis, London, UK, confirmed the isolation of B. melitensis biotype 2 from cattle. The present investigation represents the first report on the serological prevalence of brucellosis among farmers, workers and administrative personnel at dairy production stations and among cattle from the same stations in Iraq. The study demonstrates that occupational exposure to brucellosis among workers at dairy production stations and the dairy products factory is low, although still a potential source of brucella infection. The prevalence of human brucellosis reported in this study is much lower than that reported by other workers in patients with fever and those in close contact with animals[14,15,18]. Mathur et al[9] reported the prevalence of brucellosis among cattle in northern Iraq at 3.1%, which agrees approximately with this study. Our results, however, are much lower than that reported by Beattie et al[6]. Animal vaccination in Iraq was introduced in the early sixties. However no vaccination has been carried out for the last few years (Institute of Veterinary Research, personal communication). Therefore, Brucella agglutinins detected in animals could not be attributed to vaccination since Morgan et al[27] have shown that by tube agglutination test these agglutinins disappear 34 weeks after challenge. Men aged 15 to 45 years are affected with brucellosis twice as often as women of the same ages[1]. This agrees with our results.

Despite our finding of low figures of occupational exposure, it appears from recent reports[15-19] that brucellosis is endemic in Iraq. The main source of infection of patients was raw milk and unpasteurized home-made white cheese. The main sources of cheese are goats and sheep fromm northern Iraq and to a lesser extent, the cows in other parts of the country[17,18]. Consumption of fresh goat or sheep cheese heavily contaminated with B. melitensis, may be responsible for outbreaks involving families[28,29].

It is essential to educate the population about possible local sources of contamination with Brucella. Commercial dairy products and pasteurization processes should be continously monitored by the appropriate public health authorities. Immunization of commercial herds and private livestock needs to be emphasized. The true incidence of the disease needs to be studied; all suspected and confirmed cases should be promptly reported to the appropriate authorities. Perhaps a reference laboratory for brucellosis will help in the proper investigation, diagnosis and control of brucellosis in Iraq.

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